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EXAMINER
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HARM, NICKOLAS R

ART UNIT	PAPER NUMBER
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4191

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/595,550	<b>Applicant(s)</b> NATARAJAN ET AL.	
	<b>Examiner</b> NICKOLAS HARM	<b>Art Unit</b> 4191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12, 14-17, 19-23, 25 is/are rejected.
- 7) ☐ Claim(s) 6, 13, 18 and 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/27/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### SUMMARY

1. Claims 1-25 are present and have been fully considered.

#### ***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-5, 7-12, 14-17, 19-23, and 24 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2, 4, 10-12, 14-15, and 17-19 of U.S. Patent No. 6,627,020 in view of HERRON et. al. (US 4,753,694).

- a. Claim 1 requires a method to control the post-sinter dimensions of a multilayer ceramic substrate comprising the step of providing at least one first continuous non-densifying structure. Claim 1 of the '020 patent teaches the step of providing a plurality of non-densifying structures (col. 9, lines 24-25). It would be obvious to one of ordinary skill in the art that the claimed process can be

performed with only one such structure, instead of a plurality. Further, applicant explicitly states that the "continuous non-densifying structure" can accommodate discontinuities or small gaps in the shape (para. 65), therefore defining even a singular "continuous non-densifying structure" in such a way that the definition encompasses a plurality of such structures. Next, claim 1 requires the step of providing at least one personalized ceramic greensheet having local peripheral kerf area and external peripheral kerf area, as well as the step of placing at least one of the non-densifying structures on the local peripheral kerf area of at least one ceramic greensheet. One of ordinary skill in the art would know the kerf area in a ceramic greensheet is simply the region of the sheet peripheral to the personalized regions of the greensheet, and that there is no actual delineation between the local and external peripheral kerf areas. Claim 1 of the '020 patent teaches the step of placing the non-densifying structures on at least one personalized greensheet (col. 9, lines 26-28), and claim 14 of the '020 patent teaches placing the non-densifying structures on the kerf area (col. 10, lines 25-26). Finally, claim 1 requires the step of placing at least one personalized ceramic greensheet with at least one non-densifying structure in a stack of personalized greensheets, the step of laminating the stack, and the step of sintering the laminated stack under load. Claim 1 of the '020 patent teaches the step of placing at least one personalized ceramic greensheet having a non-densifying structure in a stack of personalized ceramic greensheets (col. 9, lines 29-31), the step of laminating the stack (col. 9, lines 33-34), and the step of

sintering the laminated stack (col. 9, lines 35-39). However, the '020 patent does not teach that the sintering step should be performed under load. HERRON teaches a process for producing a multilayer ceramic substrate with controlled post-sintering distortion similar to applicant's process, but teaches the application of pressure during the sintering step (col.8, lines 10-11). Therefore, claim 1 is rejected as non-statutory, obvious-type double-patenting.

b. Claim 2 requires the method of claim 1, with the additional step of post sinter sizing the multilayer ceramic substrate, thereby separating at least one non-densifying structure from the multilayer ceramic substrate. Claim 15 of the '020 patent teaches the step of sizing the multilayer ceramic substrate, thereby separating at least one non-densifying structure from the multilayer ceramic substrate (col. 10, lines 39-43).

c. Claim 3 requires the method of claim 1, with the additional step of placing a second non-densifying structure on the kerf area of the multilayer ceramic structure prior to lamination, and the step of pre-sinter sizing to remove the second non-densifying structure from the ceramic laminate prior to sintering. Claim 17 of the '020 patent teaches the step of placing a second non-densifying structure on the kerf area of the multilayer ceramic structure prior to sintering (col. 10, lines 60-63). Claim 18 of the '020 patent teaches the step of sizing the multilayer ceramic substrate, so that the second non-densifying structure is removed from the multilayer ceramic substrate (col. 11, line 9 – col. 12, line 2).

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d. Claim 4 requires the method of claim 3, with the additional limitation that the non-densifying structures are metal, ceramic, polymer, or a combination thereof. Claim 2 of the '020 patent teaches the limitation that the non-densifying structures are metal, ceramic, or a combination thereof (col. 9, lines 40-42).

e. Claim 5 requires the method of claim 3, with the additional limitation that the non-densifying structures are a metal selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel, and zirconia. Claim 4 of the '020 patent teaches the limitation that the non-densifying structures are selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel, and zirconia (col. 9, lines 46-49).

f. Claim 7 requires the method of claim 1, with the additional limitation that each personalized ceramic greensheet have a plurality of personalized regions, so that the sintered, stacked, multilayer ceramic laminate is a multi-up multilayer ceramic substrate. Claim 17 of the '020 patent teaches all the limitations of claim 7, including the limitation that the multilayer ceramic substrate is a multi-up multilayer ceramic substrate (col. 10, line 47 – col. 11, line 8).

g. Claim 8 requires the method of claim 7, with the additional step of post-sinter sizing the multi-up, multilayer ceramic substrate to form individual multilayer ceramic substrates and separate at least one non-densifying structure from the multilayer ceramic substrates. Claim 15 of the '020 patent teaches the steps of sizing the multi-layer ceramic substrate to form individual multilayer

ceramic substrates and separate at least one non-densifying structure from the multilayer ceramic substrates (col. 10, lines 39-43).

h. Claim 9 requires the method of claim 7, with the additional step of placing at least one second non-densifying structure on the kerf area of at least one personalized ceramic greensheets, and the step of pre-sinter sizing to separate at least one second non-densifying structure from the multi-up ceramic laminate prior to sintering. Claim 17 of the '020 patent teaches all the limitations of claim 7, as well as the step of placing a second non-densifying structure on the kerf area of at least one personalized ceramic greensheet (col. 10, line 47 – col. 11, line 8). Claim 18 of the '020 patent teaches the step of sizing the multi-up multilayer ceramic substrate, thereby separating at least one non-densifying structure from the multilayer ceramic substrate (col. 11, line 9 - col. 12, line 2).

i. Claim 10 requires the method of claim 7, with the additional limitation that the non-densifying structures comprise tailored shapes. Claims 10-12 of the '020 reference teach that the thickness, width, and length of the non-densifying structures should be defined relative to the thickness of the personalized ceramic greensheet (col. 10, lines 4-15). One of ordinary skill in the art would understand that if the dimensions of the non-densifying structures are defined as a multiple of the thickness of the personalized ceramic greensheet, the shapes of the non-densifying structures are tailored to the personalized ceramic greensheet.

j. Claim 11 requires the method of claim 9, with the additional limitation that the non-densifying structures are metal, ceramic, polymer, or a combination

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thereof. Claim 2 of the '020 patent teaches the limitation that the non-densifying structures are metal, ceramic, or a combination thereof (col. 9, lines 40-42).

k. Claim 12 requires the method of claim 9, with the additional limitation that the non-densifying structures are a metal selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel, and zirconia. Claim 4 of the '020 patent teaches the limitation that the non-densifying structures are selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel, and zirconia (col. 9, lines 46-49).

l. Claim 14 requires a multilayer ceramic laminate comprising a plurality of laminated ceramic greensheets, at least one personalized ceramic greensheet having a peripheral kerf area, and at least one non-densifying structure placed on the kerf area of at least one personalized ceramic greensheet. Claim 14 of the '020 patent teaches a method comprising the steps of providing at least one non-densifying structure, placing at least one non-densifying structure on the kerf area of at least one personalized ceramic greensheet, placing the at least one personalized ceramic greensheet in a stack of personalized ceramic greensheets, and laminating the stack to form a multilayer ceramic laminate (col. 10, lines 18-39). Because the multilayer ceramic laminate claimed in claim 14 is a necessary intermediate product of the process of claim 14 of the '020 patent, the multilayer ceramic laminate would be obvious to one of ordinary skill in the art and is therefore rejected.



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m. Claim 15 requires the multilayer ceramic structure of claim 14, with the additional limitation that at least one second non-densifying structure is placed on the kerf area of the structure. Claim 17 of the '020 patent teaches the step of placing at least one second non-densifying structure on the kerf area of the multilayer ceramic substrate (col. 10, lines 60-63).

n. Claim 16 requires the multilayer ceramic structure of claim 15, with the additional limitation that the second non-densifying structure is metal, ceramic, polymer, or a combination thereof. Claim 2 of the '020 patent teaches the limitation that the non-densifying structures are metal, ceramic, or a combination thereof (col. 9, lines 40-42).

o. Claim 17 requires the multilayer ceramic structure of claim 15, with the additional limitation that the non-densifying structures are a metal selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel, and zirconia. Claim 4 of the '020 patent teaches the limitation that the non-densifying structures are selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel, and zirconia (col. 9, lines 46-49).

p. Claim 19 requires the multilayer ceramic structure of claim 14, with the additional limitation that the structure is a multi-up multilayer ceramic structure. Claim 14 of the '020 patent teaches the limitation that the multilayer ceramic laminate can be a multi-up multilayer ceramic laminate (col. 10, lines 23-26).

q. Claim 20 requires the multi-up multilayer ceramic structure of claim 19, with the additional limitation that at least one second non-densifying structure is

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placed on the kerf area of the structure. Claim 17 of the '020 patent teaches the step of placing at least one second non-densifying structure on the kerf area of the multilayer ceramic substrate (col. 10, lines 60-63).

r. Claim 21 requires the multi-up multilayer ceramic structure of claim 19, with the additional limitation that the non-densifying structures comprise tailored shapes. Claims 10-12 of the '020 reference teach that the thickness, width, and length of the non-densifying structures should be defined relative to the thickness of the personalized ceramic greensheet (col. 10, lines 4-15). One of ordinary skill in the art would understand that if the dimensions of the non-densifying structures are defined as a multiple of the thickness of the personalized ceramic greensheet, the shapes of the non-densifying structures are tailored to the personalized ceramic greensheet.

s. Claim 22 requires the multi-up multilayer ceramic structure of claim 20, with the additional limitation that the second non-densifying structure is metal, ceramic, polymer, or a combination thereof. Claim 2 of the '020 patent teaches the limitation that the non-densifying structures are metal, ceramic, or a combination thereof (col. 9, lines 40-42).

t. Claim 23 requires the multi-up multilayer ceramic structure of claim 20, with the additional limitation that the non-densifying structures are a metal selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel, and zirconia. Claim 4 of the '020 patent teaches the limitation that the non-densifying structures are selected from the group consisting of

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molybdenum, nickel, copper, tungsten, stainless-steel, and zirconia (col. 9, lines 46-49).

u. Claim 25 requires the multilayer ceramic structure of claim 14, with the additional limitation that the non-densifying structures comprise tailored shapes. Claims 10-12 of the '020 reference teach that the thickness, width, and length of the non-densifying structures should be defined relative to the thickness of the personalized ceramic greensheet (col. 10, lines 4-15). One of ordinary skill in the art would understand that if the dimensions of the non-densifying structures are defined as a multiple of the thickness of the personalized ceramic greensheet, the shapes of the non-densifying structures are tailored to the personalized ceramic greensheet.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-4, 7-11, 14-16, 19-22, and 25 rejected under 35 U.S.C. 102(a) as being anticipated by LEE et al. (US 2003/0168150).

v. The limitations of claim 1 are described above. LEE teaches piling a constrain layer on a dielectric layer printed with heterogeneous materials to reduce shrinkage (para. 20). One of ordinary skill in the art would understand LEE's constrain layer to be equivalent to the claimed non-densifying structure,

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and LEE's printed dielectric layer to be equivalent to the claimed personalized ceramic greensheet. LEE teaches that more than one dielectric layer can be stacked (para. 21), that once stacked the structure can be laminated (para. 21), that the stack is subjected to a heating step (para. 22), that pressure may be applied during the firing (para. 22), and the ceramic will sinter during this step (para. 35). Therefore, claim 1 is anticipated by the LEE reference.

w. Claim 2 requires the method of claim 1, with further limitations described above. LEE teaches that the multilayer structure may be cut according to the circuit printed (para. 48), which is equivalent to the claimed step of sizing. LEE also teaches that the constraining layer need not be removed after firing (para. 24), which teaches one of ordinary skill in the art that the constraining layer may be removed after firing. Claim 2 is anticipated by the LEE reference.

x. Claim 3 requires the method of claim 1, with further limitations described above. LEE teaches placing a constrain layer on the bottom of the ceramic body (para. 20), which is equivalent to the claimed second non-densifying structure. LEE teaches that the printed portion of the ceramic sheet should not be covered by the constrain layer (para. 21), which one of ordinary skill in the art would understand to mean that the constrain layer should be placed on the kerf area of the structure. LEE teaches that the multilayer structure may be cut according to the circuit printed (para. 48), which is equivalent to the claimed step of sizing. LEE also teaches that the constraining layer need not be removed after firing

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(para. 24), which teaches one of ordinary skill in the art that the constraining layer may be removed after firing. Claim 3 is anticipated by the LEE reference.

y. Claim 4 requires the method of claim 3, with further limitations described above. LEE teaches that the constrain layer can be alumina, glass, or glass/ceramic (para. 33). Claim 4 is anticipated by the LEE reference.

z. Claim 7 requires the method of claim 1, with the additional limitation that each personalized ceramic greensheet have a plurality of personalized regions, so that the sintered, stacked, multilayer ceramic laminate is a multi-up multilayer ceramic substrate. Figure 1 of the LEE reference shows an embodiment of the LEE invention, either greensheet, laminate, or sintered substrate, which comprises at least 9 separate personalized regions. Claim 7 is anticipated by the LEE reference.

aa. Claim 8 requires the method of claim 7, with the additional limitations described above. LEE teaches that the multilayer structure may be cut according to the circuit printed (para. 48), which is equivalent to the claimed steps of sizing and separating the individual ceramic substrates. LEE also teaches that the constraining layer need not be removed after firing (para. 24), which teaches one of ordinary skill in the art that the constraining layer may be removed after firing. Claim 8 is anticipated by the LEE reference.

bb. Claim 9 requires the method of claim 7, with the additional step of placing at least one second non-densifying structure on the kerf area of at least one personalized ceramic greensheets, and the step of pre-sinter sizing to separate

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at least one second non-densifying structure from the multi-up ceramic laminate prior to sintering. LEE teaches that a constrain layer may be applied to both the top and bottom of the ceramic body in such a way that a window is left around the printed region of the ceramic body, therefore teaching that a second non-densifying body can be applied to the kerf area (para. 20). LEE goes on to teach that the constrain layer should contain windows around the personalized regions of the ceramic body (para. 20), which is equivalent to teaching that the constrain layer should be applied to the kerf region of the ceramic. LEE teaches that the multilayer structure may be cut according to the circuit printed (para. 48), which is equivalent to the claimed step of sizing. LEE also teaches that the constraining layer need not be removed after firing (para. 24), which teaches one of ordinary skill in the art that the constraining layer may be removed after firing. Claim 9 is anticipated by the LEE reference.

cc. Claim 10 requires the method of claim 7, with the additional limitations described above. LEE describes windows in the constrain layer that are in positions complying with the materials printed on the ceramic body (para. 20). One of ordinary skill in the art would understand this constrain layer, therefore, to be a shape which is tailored to the printing on the ceramic body. Claim 10 is anticipated by the LEE reference.

dd. Claim 11 requires the method of claim 9, with the additional limitations described above. LEE teaches that the constrain layer can be alumina, glass, or glass/ceramic (para. 33). Claim 11 is anticipated by the LEE reference.

ee. Claim 14 requires a multilayer ceramic laminate structure comprising a plurality of laminated ceramic greensheets, at least one personalized ceramic greensheet having a peripheral kerf area, and at least one non-densifying structure placed on the kerf area of at least one personalized ceramic greensheet. LEE teaches a plurality of dielectric layers, at least one of which is printed with heterogeneous materials, combined with constrain layers on the area around the printed region of the dielectric layers, which are laminated to form a ceramic body (para. 21). Claim 14 is anticipated by the LEE reference.

ff. Claim 15 requires the structure of claim 14, with the additional limitations described above. LEE teaches that a constrain layer may be applied to both the top and bottom of the ceramic body in such a way that a window is left around the printed region of the ceramic body, therefore teaching that a second non-densifying body can be applied to the kerf area (para. 20). Claim 15 is anticipated by the LEE reference.

gg. Claim 16 requires the structure of claim 15, with the additional limitations described above. LEE teaches that the constrain layer can be alumina, glass, or glass/ceramic (para. 33). Claim 16 is anticipated by the LEE reference.

hh. Claim 19 requires the multilayer laminate ceramic structure of claim 14, with the additional limitation that the structure is a multi-up multilayer ceramic structure. Figure 1 of the LEE reference shows an embodiment of the LEE invention, either greensheet, laminate, or sintered substrate, which comprises at least 9 separate personalized regions. One of ordinary skill in the art would

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understand Figure 1 to represent one personalized sheet in a multi-up structure, as multiple personalized regions are shown. Claim 19 is anticipated by the LEE reference.

ii. Claim 20 requires the structure of claim 19, with the additional limitations described above. LEE teaches that a constrain layer may be applied to both the top and bottom of the ceramic body in such a way that a window is left around the printed region of the ceramic body, therefore teaching that a second non-densifying body can be applied to the kerf area (para. 20). Claim 20 is anticipated by the LEE reference.

jj. Claim 21 requires the structure of claim 19, with the additional limitations described above. LEE describes windows in the constrain layer that are in positions complying with the materials printed on the ceramic body (para. 20). One of ordinary skill in the art would understand this constrain layer, therefore, to be a shape which is tailored to the printing on the ceramic body. Claim 21 is anticipated by the LEE reference.

kk. Claim 22 requires the structure of claim 20, with the additional limitations described above. LEE teaches that the constrain layer can be alumina, glass, or glass/ceramic (para. 33). Claim 22 is anticipated by the LEE reference.

ll. Claim 25 requires the structure of claim 14, with the additional limitations described above. LEE describes windows in the constrain layer that are in positions complying with the materials printed on the ceramic body (para. 20). One of ordinary skill in the art would understand this constrain layer, therefore, to



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be a shape which is tailored to the printing on the ceramic body. Claim 25 is anticipated by the LEE reference.

### ***Allowable Subject Matter***

6. Claims 6, 13, 18 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: Neither the claims of NATARAJAN (US 6,627,020 B2) nor the disclosure of LEE (US 2003/0168150 A1) teach or fairly suggest the non-densifying structure has the claimed dimensions.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICKOLAS HARM whose telephone number is (571)270-7605. The examiner can normally be reached on Mon-Thurs, 7:30a-5:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on 571-272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NICKOLAS HARM/  
Examiner, Art Unit 4191

/Barbara L. Gilliam/  
Supervisory Patent Examiner, Art Unit 4191